

Cleveland Abbe was for a time the academic contemporary of the last two named, as he is now almost their solitary meteorological successor in this country; for of others, we have lost Lawrence Rotch, founder and director of that admirable institution, the Blue Hill Meteorological Observatory, near Boston, by his untimely death four years ago.

It is the practical turn which Abbe gave to his scientific studies nearly 50 years ago that we celebrate to-night, for it was then, when he was a young man in Cincinnati in 1868, that he first put into execution in this country a scheme of daily weather prediction, based upon the telegraphic concentration of widespread synchronous observations. Would that he could be with us this evening to tell the story of that novel undertaking, but in his absence I may perhaps advert to certain matters which might embarrass him were he with us. His private enterprise was soon superseded by the establishment of a national meteorological bureau at the hands of Gen. A. J. Myer, Chief Signal Officer of the Army; and thereupon Abbe was brought to Washington as the one expert of the country qualified to set the new service on its scientific feet. Here for all these years since 1870, first in the War Department, later in the Department of Agriculture, he has been the senior scientific adviser of the Weather Service, and thus his influence in practical meteorology over the length and breadth of our land has been enormous. Although his hand has taken its turn with others at the exacting duty of daily prediction and has carried on its assigned share of the over-great volume of routine tasks that are conventionally customary in meteorological institutions, his heart has never ceased to turn to or to yearn for the more original efforts of scientific investigation. More characteristic of the man than his work in such necessary matters as the construction of tables for the daily routine of reducing barometric observations to the level of the sea, or the preparation of instructions for reducing the daily routine of meteorological duties to the level of the observer, was his translation of several difficult mathematical memoirs on the circulation of the atmosphere, published and distributed by the Smithsonian Institution, out of which I fancy he had greater enjoyment than anyone else—though that is not saying much. Evidently enough, therefore, the one great practical scheme of daily weather prediction, that has made him deservedly eminent in the application of science to the public welfare, did not divert his mind from unpractical scientific research. He has always willingly turned his attention to new problems and become happily engrossed in them when opportunity offered, yet he has ever been ready to interrupt his work and to draw on his great store of learning to answer questions from inquirers of all degrees. I fear that his scientific spirit has not at all times been happy under the regulations that are presumably appropriate in a large governmental bureau, and that his sensitive nature has sometimes been bruised by the arbitrary discipline of wholesale official service. But his is a buoyant disposition, and cheerfulness has long been his dominant quality.

We all regret his absence this evening. As he can not be with us in the flesh, let us draw him forth in spirit from his self-effacing retirement; let us see in imagination the genuine surprise that he would feel on learning of our action in selecting *him* for a high distinction; let us through our memory of other years enjoy the genial smile with which he would return our greeting. Mr. President, it is a great pleasure most cordially to present *in absentia* Prof. Cleveland Abbe, that he may receive from

you, through the hands of his former pupil, his present superior officer and his constant friend, the Chief of the Weather Bureau,¹ the medal which he so richly deserves.

REMARKS BY PROF. C. F. MARVIN.

Mr. President, members, and guests of the National Academy:

Words fail me to speak fully of my deep feeling on this occasion. I can not tell how much I appreciate this great privilege and honor that devolves upon me in accepting this medal for Prof. Abbe, with whom I have been intimately associated for more than 30 years. During this time we have worked side by side, so to speak, and I have learned not only to hold him in the greatest esteem because of his eminent work in science, but also to love him dearly because of those modest, gentle, and beautiful qualities of character that were just now set out in such touching fashion by Prof. Davis. His whole life and energies have been devoted to the advancement of the science of meteorology; he has thought only of its problems and how he could encourage and induce others to unravel its perplexities, and has never given any thought to himself. These characteristics, it seems to me, add greatly to the eminence Prof. Abbe has attained, the eminence unsought by himself but bountifully bestowed upon him by others. Only a short time ago, when it was learned that he had been awarded this medal and he had requested me to receive it for him, I asked him to tell me what to say for him in acceptance. Without a moment's hesitation he replied: "Oh, they do too much for me, they must not forget Henry, Espy, Ferrel, Lapham, and others."

I am only an humble worker in the domain of science and I could never hope to deserve so great an honor as a medal like this for myself. Therefore this is the greatest event in my life, and I feel deeply the privilege and honor of receiving this medal for Prof. Abbe, whom I love and esteem so highly. Just this morning I received a note from Prof. Abbe giving an account, in his own words, of his early work leading to the creation of the weather forecasting service in the United States.

If you will permit me, Mr. President, I should like to read what Prof. Abbe says. It will take but a few minutes and I believe the members of the Academy will be glad to hear from him.

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A SHORT ACCOUNT OF THE CIRCUMSTANCES ATTENDING THE
INCEPTION OF WEATHER FORECAST WORK
BY THE UNITED STATES.

By CLEVELAND ABBE.

My boyhood life in New York City had impressed me with the popular ignorance and also with the great need of something better than local lore and weather proverbs. The knowledge of the sailors and farmers whom I met seemed to me unsatisfactory. The popular articles in the New York daily papers, by Merriam, Espy, Joseph Henry, and others—notably Redfield and Loomis—had by 1857 convinced me that man should and must overcome our ignorance of the destructive winds and rains. It was in the summer of 1857 or 1858 that I read the beginning of the classic article by William Ferrel in the *Mathematical Monthly*. I realized that he had overcome many of the hidden difficulties of theories of storms and winds; from that day he was my guide and authority. During 1858–1864, in the practice and study of astronomy with Brünnow at Ann Arbor, Mich., and Gould at Cambridge, Mass.,

¹ Charles Frederick Marvin.

I was impressed with the unsatisfactory state of our knowledge of atmospheric refraction. Two years later my experience at Poulkova, Russia, and at our Naval Observatory, Washington, seemed to justify my conclusion that astronomers who would improve their meridional measurements must investigate their local atmospheric conditions more thoroughly and to this end must have numerous surrounding meteorological observations. Hence in my inaugural Cincinnati address of May 1, 1868, I stated that with a proper system of weather reports the public need of forecasts could be met and that astronomy could also be benefited.

This suggestion was taken up by Mr. John A. Gano, president of the local chamber of commerce; a committee met me, approved my plans, and promised the expenses of a first trial. I had the total solar eclipse of August 7, 1869, on my hands, but immediately began to arrange for 40 voluntary meteorological correspondents. On my return from observing the eclipse at Sioux Falls City, I stopped at Chicago and formally invited the Chicago Board of Trade to join in extending the Cincinnati system to the Great Lakes, but this invitation was declined by the Chicago Board of Trade. An editorial in a Chicago evening paper of Monday, August 16, 1869, stated the scientific basis of our observatory work. I returned at once to Cincinnati, issued the first number of the Cincinnati Weather Bulletin promptly, as promised, on September 1, 1869; it contained a few observations telegraphed from distant observers and the "probabilities" for the next day. This bulletin was posted, in my own handwriting, prominently in the hall of the chamber; but I soon found below my misspelled "Teusday" a humorous line by Mr. ——— Davis, the well-known packer: "A bad spell of weather for 'Old Probs.'" This established my future very popular name "Old Probs."

My forecasts were treated very kindly by all. I had anticipated a slow increase in accuracy; I ventured to write my father in New York City "I have started that which the country will not willingly let die." I wrote a short note to the New York Times (or Tribune) telling them how useful we could be to their shipping. On September 3, 1869, I even ventured to offer a daily telegram by the French cable to Le Verrier as founder of the Bulletin Hebdomadaire de l'Association Scientifique, and who could fully sympathize with my hopes and plans. He realized the breakers ahead of me better than I. My daily telegram from Milwaukee came from the well-known Smithsonian observer and author, Prof. Increase Allen Lapham. He had known and appreciated the works of Espy, Redfield, Loomis, and others, but he had become absorbed in other studies; he now urged the local Milwaukee society to do something for Lake Michigan. His friends were just about to go to the Richmond meeting of the National Board of Trade; there they met William Hooper and John A. Gano. These merchants of Cincinnati found that they had the same idea as H. E. Paine, of Milwaukee, i. e., that the Federal Government should develop the Cincinnati enterprise and make it useful to the whole country. The National Board of Trade indorsed this idea; Prof. Lapham, of Milwaukee, drew up some statistics of storms and destruction on the Lakes; the Hon. Halbert E. Paine prepared Public Resolution No. 9; we each put our shoulders to the wheel and behold on February 9, 1870, the Secretary of War was authorized to carry out this new duty. I had spent a year in finding stations, voluntary observers, and telegraph facilities; every old classmate or friend of progressive meteorology had helped the new idea. The work had now passed out of my hands. I saw that I must soon go back to the

observatory work that I had undertaken—the rejuvenation of the famous old Cincinnati observatory—but there was much more to be done. A letter from the Chief Signal Officer, United States Army, Gen. Albert J. Myer, asked for all possible cooperation. The officials of the Western Union Telegraph Co. offered the observatory the same free daily weather reports that they had for 20 years been giving to the Smithsonian Institution and the daily press; so I continued temporarily to make and publish the Cincinnati Bulletin, but in a much simpler form and without forecasts. This continued until May 10, 1870, when I was married, and the preparation of the midnight bulletin passed over to the officials of the local telegraph office. It was continued in this shape until November, 1870, when the tridaily bulletins of the Army Signal Service began. With the help of ——— Williams, who was in charge of the Western Union office, I printed in October, 1869, a code of cipher, and should have used this code for economy, had not the Joint Resolution of February 9, 1870, anticipated further reports by my own stations. This code was subsequently greatly improved by Weather Bureau men, and particularly by Gen. A. W. Greely, and it is still in use.

The manifolded duplicate copies and the printed copies of the daily Cincinnati Observatory Bulletin were distributed until the chamber of commerce no longer needed to support it; then Mr. Williams devised a simple form of manifold map that was a great improvement on my original tabular form of daily reports. This map was soon adopted by the Signal Service, but was itself displaced in turn by the present handsome daily lithographed chart. Without the help of Armstrong and Williams and the new manifold method patented by J. Jones we could not have promptly responded to the needs of our friends.

By November, 1870, I had gone to New York and prepared to go as astronomer on one of the Panama Canal surveys, but I gave this up and should have returned soon to Cincinnati had I not, in December, received a letter from Gen. Myer stating that he wished to see me. My work with him in the Weather Bureau of the Army Signal Service began January 3, 1871. After a month's practice it was decided that my forecast would evidently more than fill the popular expectations and tridaily publications began at once. The term "probabilities" then became official, as it had begun in 1869, and in those days it was appropriate; but we have long since used and accepted the word "forecast."

The subsequent development of the service under Gens. Myer, Hazen, and Greely, and Profs. Harrington, Moore, and Marvin may be gathered from their special or annual reports. The service has been greatly favored by the hearty cooperation of many men of knowledge, skill, and enthusiasm.

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USE OF THE TERM "INDIAN SUMMER" IN 1778 ?

It is gratifying to learn from a recent paper by Mr. Horace E. Ware,¹ read before the Colonial Society of Massachusetts that the search for facts bearing on the origin of the term "Indian summer" as applied to certain phases of our fall weather, keeps alive.

Mr. Ware's paper cites a poem of 1815, by Philip Freneau, as the first appearance of the term in *poetry*; he also quotes Mrs. Sigourney's poem on the subject, written before and published in 1849.

¹ Ware, Horace E. Notes on the term "Indian summer." Pub., Colonial Soc. of Mass., Cambridge, Mass., 1916, 16: 123-130.